ELECTRORESISTANCE IN EPITAXIAL HZO FILMS

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Hf0.5Zr0.5O2 (HZO) ferroelectric tunnel barriers are receiving renewed attention since epitaxial thin films have become available. Indeed, epitaxial thin films have allowed reaching a deeper understanding of the role of epitaxial strain on their microstructure and its connection to the subtle balance among the different polymorphs, ferroelectric and not, of HZO. The impact of the microstructure on the electroresistance (ER) of ultrathin films is enormous. Here, I shall overview recent progress aiming to understand and tailor the phase coexistence in epitaxial films, and its relevance on measured ER, typically involving an intricate combination of genuine ferroelectric (FE) and ionic-like (IO) responses. It will be argued that suitable substrate selection allows suppressing IO-like response. Interestingly, it will also show that suitable dielectric capping allows increase the yield and endurance of tunel devices within thickness down to 1.5 nn.

References

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